## REMARKS

Claims 1-5 are all the claims pending in the application. By this Amendment, Applicant editorially amends claims 1-5 to cure minor informalities.

Summary of the Office Action

Claim 5 is rejected under 35 U.S.C. § 112, first paragraph and claims 1-5 are rejected under 35 U.S.C. § 103(a).

Claim Rejection under 35 U.S.C. § 103

Claim 5 is rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. Specifically, the Examiner alleges that the specification fails to provide support for the control unit that sets only the k-th pulse width (*see* page 2 of the Office Action). Applicant respectfully disagrees.

Dependent claim 5 recites: "wherein the control unit determines the predetermined value of the quantity of supply of hard coat material by the emission of electrode material according to the predetermined processing condition by controllably setting only the k-th pulse width." That is, claim 5 recites that the quantity of supply of hard coat material is determined exclusively by controllably setting the parameters of the k-th pulses. In other words, in an exemplary, non-limiting embodiment the control unit controls the first pulse so that the emission of electrode material is suppressed. Thereafter, however, the control unit controls the width and peak values of the subsequent pulses so that a predetermined value of the electrode material is supplied. In other words, the quantity of the electrode material supplied is determined based on the parameters of the supplied pulses, such that during the first pulse, the supply of the electrode

material is suppressed and thereafter it is controllably supplied (Figs. 1B and 1C and pages 13-14 of the specification).

For at least these exemplary reasons, Applicant respectfully submits that claim 5 is supported by the specification. Accordingly, it is appropriate and necessary for the Examiner to withdraw this rejection of claim 5.

Prior Art Rejections

Claims 1-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,858,479 to Saito et al. (hereinafter "Saito") in view of U.S. Patent No. 5,434,380 to Magara et al. (hereinafter "Magara") and as being unpatentable over JP 5-148,615 to Saito et al. (hereinafter "JP Saito") in view of Magara. Applicant respectfully traverses these grounds for a rejection in view of the following comments.

Claim 1 recites "said control unit setting the first pulse width and the first peak value so that an electric current density between the electrodes is in a predetermined range which suppresses emission of electrode material, so that during a period of the first pulse width a diameter of an electric discharge arc column is extended,....a quantity of supply of hard coat material by the emission of electrode material is a predetermined value determined according to a predetermined processing condition."

The Examiner acknowledges that Saito and JP Saito do not teach or suggest the above-quoted unique features of claim 1. The Examiner, however, alleges that Magara cures the deficiencies of Saito and JP Saito (*see* pages 3 and 4 of the Office Action). Specifically, the

Examiner alleges that Magara discloses a step-up current, and as such, inherently discloses controlling the quantity of the supply of the hard coat material. Applicant respectfully disagrees.

While Magara teaches a step-up current impulse diagram shown in Fig. 16(b), nowhere in the Magara patent is it taught or suggested that the pulse width and the peak value are controlled in a stepwise manner so that the quantity of supply of hard coat material by emission of electrode material is also controlled. For example, in Magara, there is no control unit that sets the first pulse width and the first peak value such that the electric density between the electrodes can be in a predetermined range to suppress emission of electrode material. Further, in Magara, there is no control of the increase of a diameter of the electric discharge arc column. No such control is disclosed in Magara. By way of an analogy, a plane crashing (inherently falling due to gravity) would not suggest the plane landing (controlled descent). In short, it is Applicant's position that Magara's disclosure of a step-up current impulse diagram shown in Fig. 16(b) would not suggest controlling the quantity of supply of hard coat material.

Furthermore, the auxiliary power supply of Magara is provided to generate a spark (col. 8, lines 49 to 53). There is no disclosure or suggestion in Magara of controlling the pulse width of the pulse provided by the auxiliary supply unit. In short, Magara does not cure the deficient disclosures of Saito and JP Saito.

Furthermore, one of ordinary skill in the art would not have been motivated to combine the references in the manner suggested by the Examiner. The Examiner contends that one of ordinary skill in the art would have been motivated to include the control of Magara into the

system of Saito and JP Saito to "minimize surface roughness" (*see* pages 3 and 4 of the Office Action).

However, the proposed combination is unworkable. To minimize surface roughness, Magara discloses preventing the electrode material from sticking to the workpiece (col. 5, lines 24 to 31). Accordingly, if one of ordinary skill in the art would have combined Saito with Magara, instead of the electrode sticking to the surface of the workpiece, the silicon particles of the solution would have been used and the electrode would have been prevented from sticking to the workpiece.

This would defeat the purpose of the Saito reference of providing strong adherence for a sintered material workpiece by having a special electrode that can remove the oxide film and then bond to the workpiece. Similarly, incorporating the control unit of Magara would defeat the purpose of the JP Saito reference. JP Saito is concerned with forming a coating of a sufficient thickness and as such uses electrode materials as a cover layer. If JP Saito is combined with Magara for minimizing surface roughness, then instead of the electrode materials sticking to the workpiece, silicon particles in the solution would have been used. This would defeat the purpose of the Saito reference of obtaining a coating with sufficient thickness by using various electrode materials for the coating layer.

In short, Magara's control method is provided for improved smoothness, which is made possible by preventing the electrode material from sticking to the surface of the workpiece (col. 5, lines 24 to 31 and col. 7, lines 29 to 33). Accordingly, if one of ordinary skill in the art would

have combined Magara with Saito or JP Saito, then instead of having the electrode material stick to the workpiece, the electrode material would be prevented from sticking to the workpiece.

In summary, one of ordinary skill in the art would not have been motivated to incorporate a control unit of Magara for preventing the electrode material from sticking to the workpiece into a system for coating the workpiece with the electrode material such as systems of Saito and JP Saito. The suggested combination of references would require a substantial reconstruction and redesign of the elements shown in Saito and JP Saito as well as a change in the basic principle under which the Saito and JP Saito constructions were designed to operate. Therefore, one of ordinary skill in the art, but for the present invention, would not have combined Saito and Magara and JP Saito and Magara. For at least these exemplary reasons, claim 1 is patentable over the combined disclosure of Saito in view of Magara and JP Saito in view of Magara.

Claims 2 and 3 recite features similar to those described above with respect to claim 1. Accordingly, claims 2 and 3 are not obvious in view of the combined teachings of Saito and Magara and JP Saito and Magara, based on a rationale analogous to that set forth above for claim 1.

Claims 4 and 5 are patentable at least by virtue of their dependency on claim 1.

Furthermore, claim 4 recites: "consumption of the electrode material for forming the hard coat on the surface of the workpiece is decreased by the control unit setting the k-th pulse width and k-th peak value." The Examiner acknowledges that Saito and JP Saito do not disclose or suggest these unique features of claim 4. The Examiner, however, alleges that Magara cures the deficient disclosure of these two references (*see* pages 3 and 4 of the Office Action).

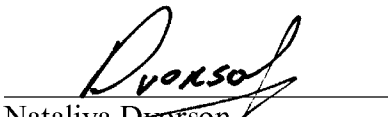
It is respectfully noted, however, that the electrode material of Magara is not used for forming the hard coat. That is, the hard coat as disclosed in Magara is formed out of the silicon particles in the solution. Clearly then, the step-up current impulses of Magara do not decrease the consumption of the electrode material for forming the hard coat. There is no suggestion that the pulses are set in a way that the consumption of the electrode material is decreased or controlled. For at least this additional exemplary reason, claim 4 is patentable over the combined disclosure of Saito and Magara and JP Saito and Magara.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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